



Grant Agreement 823805 MAIL H2020 MSCA RISE 2018

The concept of Marginal Lands

An overview



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 823805

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Mail project workshop, November 25th-26th, Online



Main objective

Trigger utilization of marginal lands as Carbon Sinks by activities related to forestry (LULUCF)

Mail

focus on Marginal Lands that have:

- Afforestation/reforestation capacity
- no effect in the agri-food production sector

aims to encourage a holistic rethinking of marginal lands in order to optimize their use in the framework of climate change mitigation



What is marginal land?

Economic definition

An area where a cost-effective production is not possible, under given site conditions, cultivation techniques, agricultural policies as well as macro-economic and legal conditions (Schroers, 2006);

Where revenue is just equal to costs of production (Galbraith, 1932)

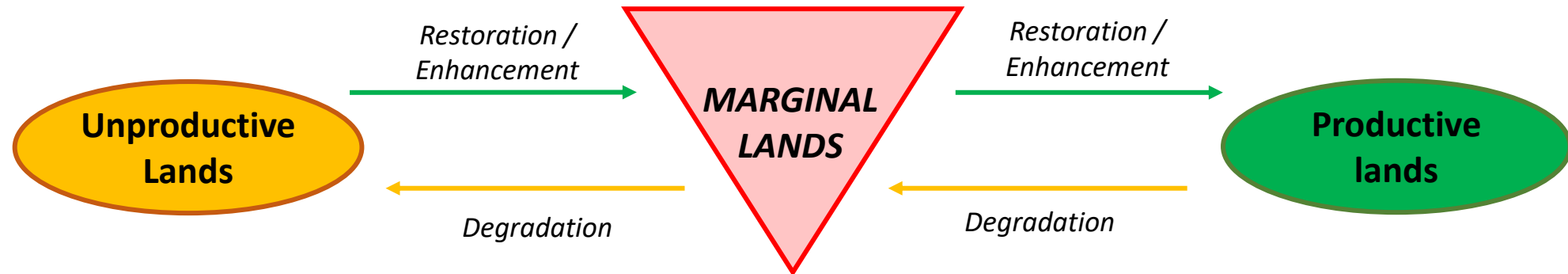
Physical and production definition

marginality is based on soil suitability and other restrictions that are often adopted by soil scientists and agronomists for the purpose of land use planning.

It refers to agriculture land of poor quality or susceptible to erosion or other degradation (Lal, 2005)

Transition status of Marginal Lands in terms of productivity

A transitional state of land uses – marginal lands (Kang et al., 2013a)





Similar Terms for Marginal Lands

1. unproductive land
2. waste land
3. under-utilized land
4. idle land
5. abandoned land
6. degraded land
7. conservation reserve programme land (CRP)
8. barren land
9. carbon-poor land
10. fallow land
11. reclaimed land
12. contaminated land
13. etc.

**Marginality is
RELATIVE**



Marginality defining factors

Mostly environmental constraints,
focusing on agricultural revenue, such as;

- Poor soil
- Slope
- Climate
- Accessibility
- Irrigation or
- Cultivation means

More modern factors taking into
account different benefits such as;

- Ecosystem services
- Carbon storage
- Biodiversity or
- Recreation

**Marginality is
GOAL ORIENTED**



Results of the Literature Review

Study	Environmental Variables				Productivity	Land Cover / Use	Socio-economic
	Soil	Climate	Terrain	Sustainability Concerns			
Bai et al. (2008)		✓			✓	✓	
Bertaglia et al. (2007)						✓	✓
Cai et al. (2011)	✓	✓	✓			✓	
Ciria et al. (2018)	✓	✓			✓		
Gelfand et al. (2013)	✓	✓	✓			✓	
Gerwin et al. (2018)	✓	✓	✓	✓			
Gopalakrishnan et al. (2011)	✓		✓	✓	✓	✓	
Kang, Post, Wang et al. (2013)	✓	✓	✓	✓	✓		✓
Li et al. (2017)	✓	✓	✓	✓		✓	
Liu et al. (2011)	✓		✓			✓	
Milbrandt & Overend (2009)	✓	✓	✓			✓	
Niu & Duiker (2006)				✓	✓	✓	

Abad, A. & Felten, B. (2019)



Parameters that taken into account

- **Avoid conflict with food production**
- **Avoid conflict with nature conservation purposes**
- **Avoid sub-urban areas where the land value is high**
- **Have Carbon Capacity potentials**
- **Have active contribution in forestry EU policies in order to increase the C stock (afforestation/ reforestation projects)**
- **Focus on locations where the conflict with agri-food production is minimum**

MaiL's
TARGET

Examples #1

Grasslands / partially forested areas



(Personal collection, 2012)

Abandoned agricultural areas



(Personal collection, 2012)

Examples #2

Open mine restoration areas



(Personal collection, 2015)

Quarries



(Personal collection, 2017)

Examples #3

Reforested areas

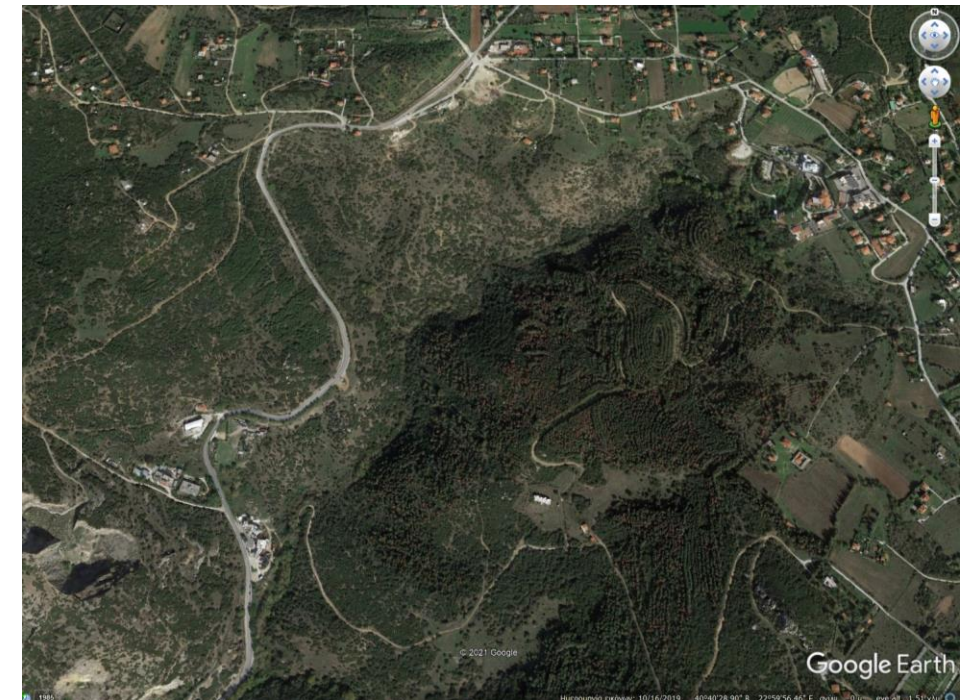
Seih Sou - Thessaloniki's suburban forest



(Η ιστορία του Σείχ Σου, 2019)

Afforested areas

Filyro, Thessaloniki, Greece



(Google Earth, 2018)

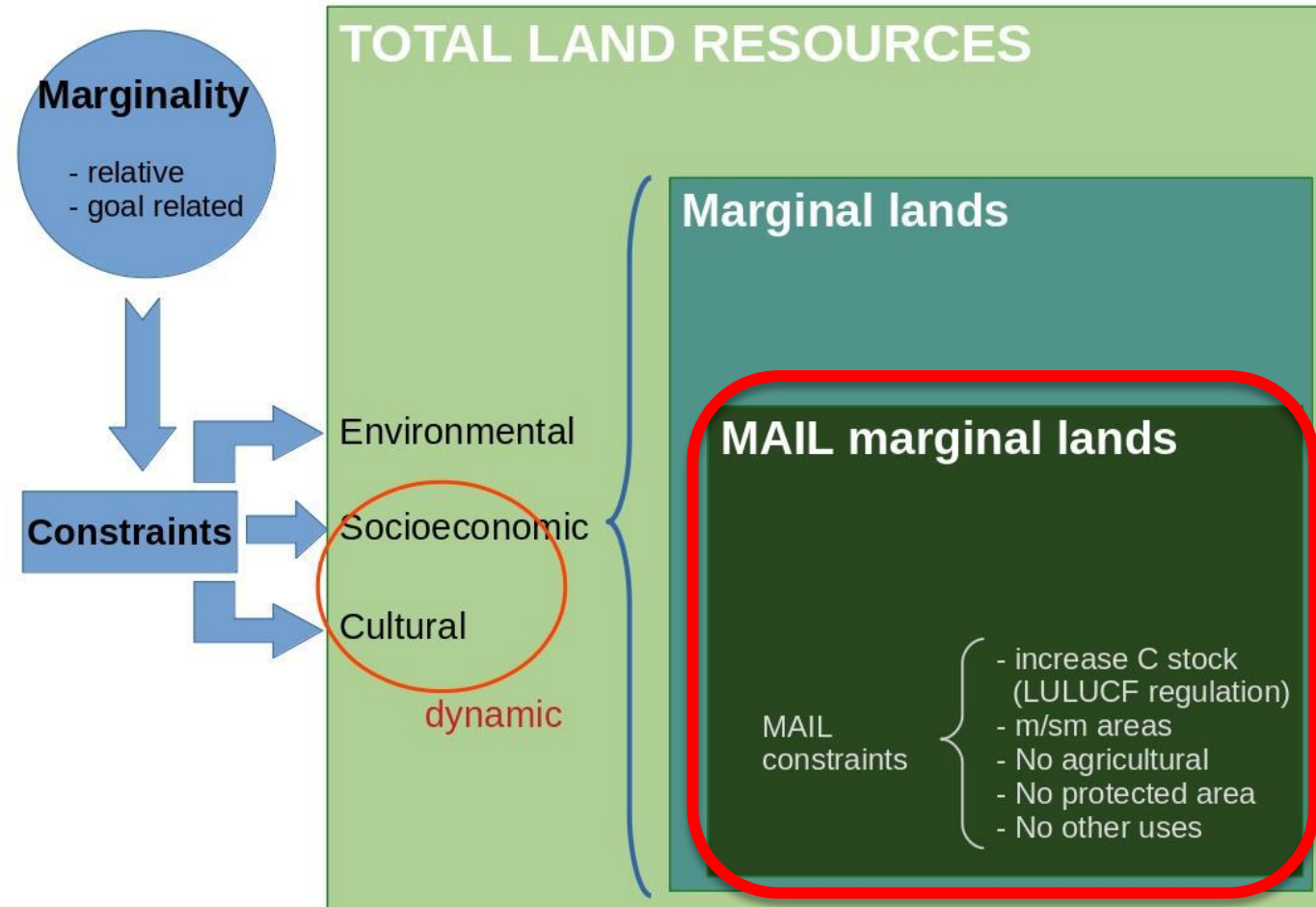
Definition

Marginal lands for the **Mail** project are:

- Lands with potential impact to national accounting for C stock, excluding agricultural lands and other valuable areas
- Lands that is possible to be converted to forest lands (according to IPCC), such as grasslands, abandoned croplands or other lands

Marginality is;

- **relative**
- **Goal oriented**
- **affected by multiple constraints**



Abad, A. & Felten, B. (2019)



Basic Criteria #1

Category	Criterion
Topography	Latitude
	elevation
	Slope
	aspect
Land use/ cover	land cover
Climate	rainfall
	Min & Max Temperature

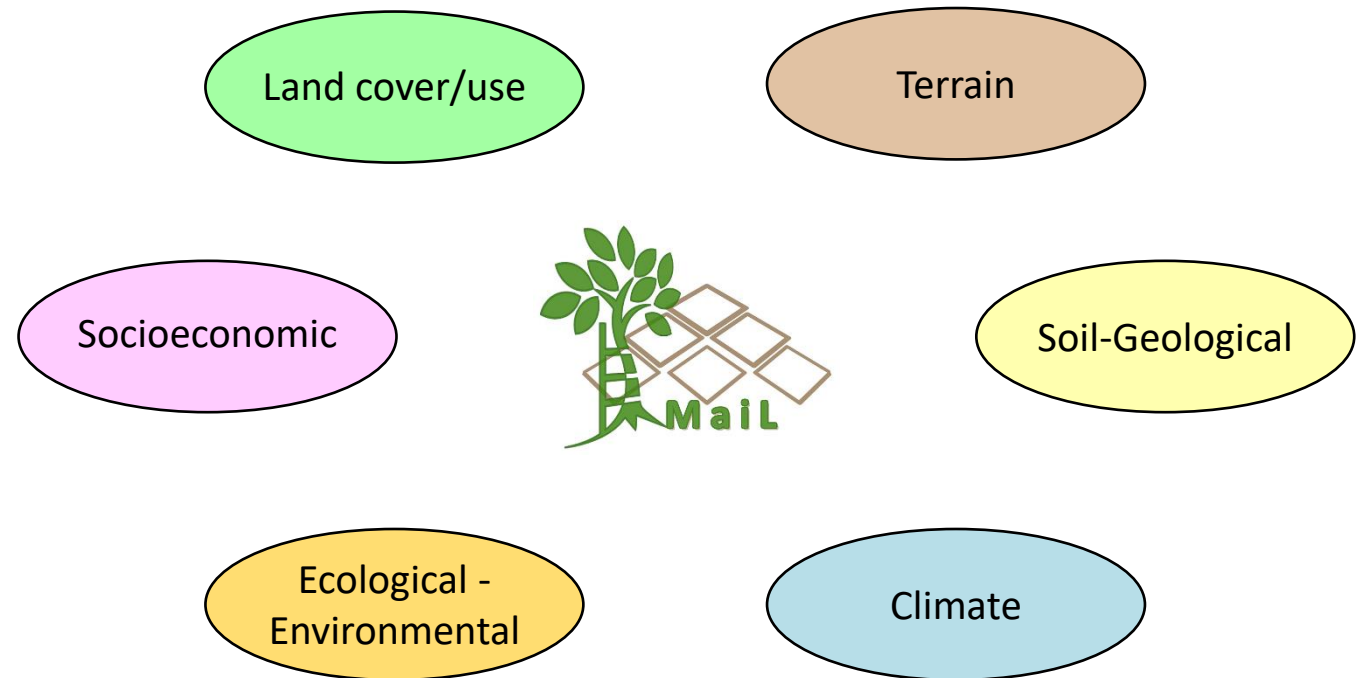
Category	Criterion
Soil	moisture regime
	soil productivity
	soil depth
	soil erosion
	soil pH
	soil pollution

Category	Criterion
Infrastructure	accessibility
	irrigation
Biodiversity - Nature protection	critical habitats for protected species
	priority habitats
	protected areas
Socio-economic	Parcel area
	Distance from a city
	Breakeven price or yield

Basic Criteria #2

An extended review was realized in order to detect and evaluate the available European or Global scale datasets that will help to assess characteristics regarding marginality

The collected datasets were separated in 6 main categories

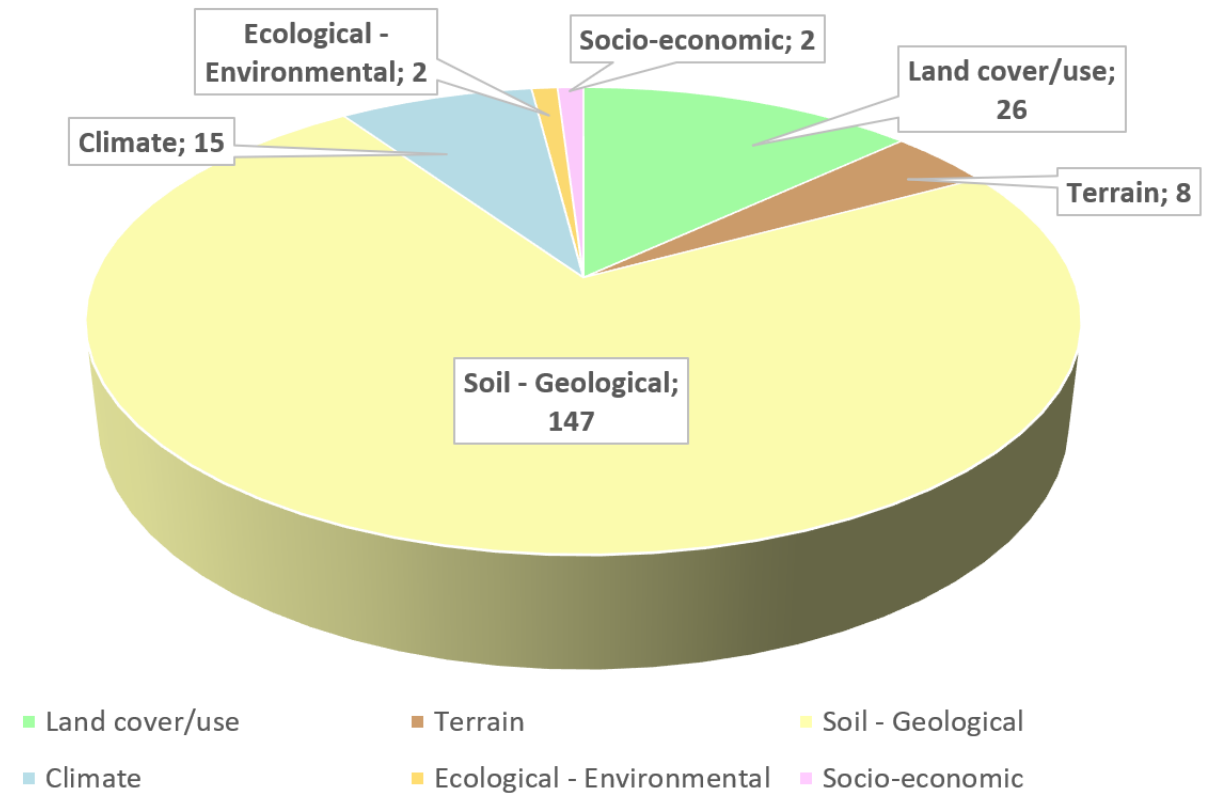




Basic Criteria #3

A summary of the available European or Global scale datasets that we collect in order to assess marginality characteristics

Category	Datasets	Subsets
Land cover/use	7	26
Terrain	2	8
Soil - Geological	21	147
Climate	2	15
Ecological - Environmental	2	2
Socio-economic	2	2
SUM	36	200





Constraints classification

The marginality defining factors separated in two groups;

HARD constraints

Binary exclusion factors (*e.g. field crops or absolute Nature Reserve Areas*)

SOFT constraints

Factors with variable thresholds (*e.g. elevation or productivity*)

...more details by prof. Georgiadis (AUTH)



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Thank you for your attention!



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